What is claimed is:

1.   A signal processor, comprising:

a pulse width modulator having a clock rate; and

a digital filter configured to receive an output of said pulse width modulator,

wherein said output comprises a distortion, and wherein said digital filter samples said

output at said clock rate to suppress said distortion.

2.   The signal processor of claim 1, further comprising an oversampling

modulator.

3.   The signal processor of claim 2, wherein said oversampling modulator

comprises a sigma-delta type modulator.

4.   The signal processor of claim 3, wherein said oversampling modulator is

upstream of said pulse width modulator.

5.   The signal processor of claim 4, wherein said oversampling modulator

generates an oversampled signal having a period and a total number of levels, and

wherein said clock rate is M times said period, where M is said total number of levels in

said oversampled signal.

6.   The signal processor of claim 5, wherein said sigma-delta type modulator

comprises a first order sigma-delta type modulator.

7.   The signal processor of claim 3, further comprising an integrator upstream

of said pulse width modulator.

8.   The signal processor of claim 1, wherein said digital filter comprises an

IIR filter.

9.   The signal processor of claim 8, wherein said IIR filter comprises a single pole filter.

10.   The signal processor of claim 1, wherein said digital filter comprises a low pass filter.

11.   The signal processor of claim 1, further comprising a feedback path comprising said digital filter.

12.   An integrated circuit chip system comprising the signal processor of claim 1.

13.   The integrated circuit chip system of claim 12, wherein said system provides a two-channel output.

14.   The integrated circuit chip system of claim 12, wherein said system provides an eight-channel output.

15.   A portable audio player comprising the signal processor of claim 1.

16.   The portable audio player of claim 15, further comprising a digital audio signal source.

17.   The portable audio player of claim 10, wherein said digital audio source comprises a memory medium reader.

18.   The portable audio player of claim 17, wherein said memory medium reader comprises an optical disk reader.

19.   The portable audio player of claim 16, wherein said digital audio signal source comprises a memory for storage of a digital audio file.

20.   The portable audio player of claim 16, wherein said digital audio signal source comprises a digital receiver.

21.   An audio power amplification system comprising the signal processor of claim 1.

22.   The audio power amplification system of claim 20, further comprising an RC type demodulation filter.

23.   A digital circuit for suppressing a distortion in a digital signal that exists after a pulse width modulation, wherein said pulse width modulation occurs at a clock rate, and wherein said digital circuit comprises a digital filter configured to receive said signal having said distortion and to sample said signal at said clock rate to suppress said distortion.

24.   A digital signal processing circuit, comprising:

a pulse width modulator having an output with a distortion; and

means for sampling said output and suppressing said distortion in a digital domain.

25.   The digital signal processing circuit of claim 24, further comprising an oversampling modulator.

26.   The digital signal processing circuit of claim 25, wherein said oversampling modulator comprises a sigma-delta type modulator.

27.   The digital signal processing circuit of claim 26, wherein said sigma-delta type modulator comprises a first order sigma-delta type modulator.

28.   The digital signal processing circuit of claim 25, wherein said oversampling modulator is upstream of said pulse width modulator.

29.   The digital signal processing circuit of claim 28, wherein said oversampling modulator generates an oversampled signal having a period and a total

number of levels, and said pulse width modulator operates at a clock rate that is M times

said period, where M is said total number of levels in said oversampled signal.

30.   The digital signal processing circuit of claim 25, further comprising an

integrator upstream of said pulse width modulator.

31.   An integrated circuit chip system comprising the signal processor of claim

24.

32.   The integrated circuit chip system of claim 31, wherein said system

provides a two-channel output.

33.   The integrated circuit chip system of claim 31, wherein said system

provides an eight-channel output.

34.   An audio power amplification system comprising the signal processor of

claim 24.

35.   The audio power amplification system of claim 34, further comprising an

RC type demodulation filter.

36.   A portable audio player comprising the signal processor of claim 24.

37.   The portable audio player of claim 36, further comprising a digital audio

signal source.

38.   The portable audio player of claim 37, wherein said digital audio signal

source comprises a memory medium reader.

39.   The portable audio player of claim 38, wherein said memory medium

reader comprises an optical disk reader.

40.   The portable audio player of claim 37, wherein said digital audio signal

source comprises a memory for storage of a digital audio file.

41.   The portable audio player of claim 37, wherein said digital audio signal source comprises a digital receiver.

42.   The digital signal processing circuit of claim 24, wherein said sampling occurs at a clock rate of said pulse width modulator.

43.   A signal processor for modulating a digital input signal, comprising a closed loop digital circuit comprising:

a forward path comprising a first filter stage coupled with and upstream from an encoder stage, wherein said encoder stage comprises a first order sigma-delta type modulator and a pulse width modulator, wherein said sigma-delta type modulator generates an oversampled signal having a period and a total number of levels, and said pulse width modulator operates at a clock rate that is M times said period, where M is said total number of levels in said oversampled signal, and wherein said forward path produces an output having a distortion; and

a feedback path comprising a low pass single pole IIR digital filter that samples said output in a digital domain to suppress said distortion.

44.   The signal processor of claim 43, wherein said digital filter samples said output at said clock rate.

45.   The signal processor of claim 43, wherein said signal processor exhibits a modulation depth of up to about −1 db in an audio frequency band.

46.   The signal processor of claim 43, wherein said signal processor reduces a total harmonic distortion to about 90 − 100 db.

47.   A signal processor, comprising:

a digital oversampling circuit coupled with a digital pulse width modulating

circuit having an output; and

a feedback path comprising a digital filter that samples said output in a digital

domain.

48.   An integrated circuit chip configured to receive a pulse code modulated

digital signal and to generate a pulse width modulated digital output signal, wherein said

output signal has a distortion, and wherein said distortion is suppressed by a digital filter

that operates at a clock rate of said pulse width modulated digital signal.

49.   A method, comprising:

modulating a first pulse code modulated signal having a first resolution into a

second pulse code modulated signal having a second resolution, wherein said second

resolution is smaller than said first resolution;

modulating said second pulse code modulated signal into a third signal

comprising a plurality of pulses in time having a clock rate; and

filtering in a digital domain said plurality of pulses in time to suppress a distortion

in said third signal.

50.   The method of claim 49, wherein said first resolution is between 12 bits

and 24 bits inclusively.

51.   The method of claim 50, wherein said first resolution is 16 bits.

52.   The method of claim 50, wherein said second resolution is between 2 bits

and 6 bits inclusively.

53.   The method of claim 52, wherein said second resolution is 4 bits.

54.   The method of claim 49, wherein said modulating said first pulse code

modulated signal comprises using a sigma-delta type modulator.

55.   The method of claim 54, wherein said sigma-delta type modulator is a first order sigma-delta type modulator.

56.   The method of claim 49, wherein said modulating said second pulse code modulated signal comprises using a pulse width modulator.

57.   The method of claim 49, wherein said filtering comprises using a digital filter.

58.   The method of claim 57, wherein said digital filter comprises an IIR filter.

59.   The method of claim 58, wherein said IIR filter comprises a single pole filter.

60.   The method of claim 57, wherein said digital filter comprises a low pass filter.

61.   The method of claim 49, wherein said filtering comprises forming a feedback signal having said first resolution.

62.   The method of claim 49, wherein said plurality of pulses in time is a substantially small range of pulses in time.

63.   The method of claim 49, wherein said modulating said first pulse code modulated signal comprises generating an oversampled signal having a period and a total number of levels, wherein said modulating said second pulse code modulated digital signal occurs at a clock rate that is M times said period, where M is said total number of levels in said oversampled signal.

64.   The method of claim 49, wherein said filtering comprises sampling at said clock rate.

65. The method of claim 49, further comprising amplifying said third signal to produce an amplified output.

66. The method of claim 65, further comprising creating an analog signal from said amplified output.

67. The method of claim 66, wherein said creating comprises using an RC filter circuit.

68. A device, comprising:

means for modulating a first pulse code modulated signal having a first resolution into a second pulse code modulated signal having a second resolution, wherein said second resolution is smaller than said first resolution;

means for modulating said second pulse code modulated signal into a third signal comprising a plurality of pulses in time having a clock rate; and

means for filtering in a digital domain said plurality of pulses in time to suppress a distortion in said third signal.